

SEQUENCE LISTING

<110> Byrne, Barry J.
Mah, Cathryn S.

<120> rAAV COMPOSITIONS AND METHODS FOR DELIVERY OF HUMAN FACTOR VII
POLYPEPTIDES AND TREATMENT OF HEMOPHILIA A

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<140> UNKNOWN

<141> 2004-12-28

<150> PCT/US03/20756

<151> 2003-06-30

<150> 60/392,725

<151> 2002-06-28

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<170> PatentIn version 3.2

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Arg Asp Met Pro Trp Lys Pro Gly Pro His Arg Val Phe Val Thr Gln
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Glu Glu Ala His Gly Val Leu His Arg Arg Arg Arg Ala Asn Ala Phe
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Leu Glu Glu Leu Arg Pro Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu
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Gln Cys Ser Phe Glu Glu Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg
 85 90 95

Thr Lys Leu Phe Trp Ile Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser
 100 105 110

Ser Pro Cys Gln Asn Gly Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr
 115 120 125

Ile Cys Phe Cys Leu Pro Ala Phe Glu Gly Arg Asn Cys Glu Thr His
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Lys Asp Asp Gln Leu Ile Cys Val Asn Glu Asn Gly Gly Cys Glu Gln

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Gly Tyr Ser Leu Leu Ala Asp Gly Val Ser Cys Thr Pro Thr Val Glu						
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Tyr Pro Cys Gly Lys Ile Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys						
		195		200		205
Pro Gln Gly Arg Ile Val Gly Gly Lys Val Cys Pro Lys Gly Glu Cys						
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Pro Trp Gln Val Leu Leu Leu Val Asn Gly Ala Gln Leu Cys Gly Gly						
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Thr Leu Ile Asn Thr Ile Trp Val Val Ser Ala Ala His Cys Phe Asp						
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Lys Ile Lys Asn Trp Arg Asn Leu Ile Ala Val Leu Gly Glu His Asp						
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Leu Ser Glu His Asp Gly Asp Glu Gln Ser Arg Arg Val Ala Gln Val						
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Ile Ile Pro Ser Thr Tyr Val Pro Gly Thr Thr Asn His Asp Ile Ala						
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Leu Leu Arg Leu His Gln Pro Val Val Leu Thr Asp His Val Val Pro						
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Leu Cys Leu Pro Glu Arg Thr Phe Ser Glu Arg Thr Leu Ala Phe Val						
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Arg Phe Ser Leu Val Ser Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala						
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Thr Ala Leu Glu Leu Met Val Leu Asn Val Pro Arg Leu Met Thr Gln						
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Asp Cys Leu Gln Gln Ser Arg Lys Val Gly Asp Ser Pro Asn Ile Thr						
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Glu Tyr Met Phe Cys Ala Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys						
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Tyr Leu Thr Gly Ile Val Ser Trp Gly Gln Gly Cys Ala Thr Val Gly
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His Phe Gly Val Tyr Thr Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln
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Phe Pro
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Arg Asp Met Pro Trp Lys Pro Gly Pro His Arg Val Phe Val Thr Gln
 35 40 45

Glu Glu Ala His Gly Val Leu His Arg Arg Arg Arg Ala Asn Ala Phe
 50 55 60

Leu Glu Glu Leu Arg Pro Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu
 65 70 75 80

Gln Cys Ser Phe Glu Glu Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg
 85 90 95

Thr Lys Leu Phe Trp Ile Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser
 100 105 110

Ser Pro Cys Gln Asn Gly Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr
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Ile Cys Phe Cys Leu Pro Ala Phe Glu Gly Arg Asn Cys Glu Thr His
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Lys Asp Asp Gln Leu Ile Cys Val Asn Glu Asn Gly Gly Cys Glu Gln

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Gly Tyr Ser Leu	Leu Ala Asp Gly Val Ser Cys Thr Pro Thr Val Glu	180	185	190		
Tyr Pro Cys Gly	Lys Ile Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys	195	200	205		
Pro Gln Gly Arg	Ile Val Gly Gly Lys Val Cys Pro Lys Gly Glu Cys	210	215	220		
Pro Trp Gln Val	Leu Leu Leu Val Asn Gly Ala Gln Leu Cys Gly Gly	225	230	235	240	
Thr Leu Ile Asn	Thr Ile Trp Val Val Ser Ala Ala His Cys Phe Asp	245	250	255		
Lys Ile Lys Asn	Trp Arg Asn Leu Ile Ala Val Leu Gly Glu His Asp	260	265	270		
Leu Ser Glu His	Asp Gly Asp Glu Gln Ser Arg Arg Val Ala Gln Val	275	280	285		
Ile Ile Pro Ser	Thr Tyr Val Pro Gly Thr Thr Asn His Asp Ile Ala	290	295	300		
Leu Leu Arg Leu	His Gln Pro Val Val Leu Thr Asp His Val Val Pro	305	310	315	320	
Leu Cys Leu Pro	Glu Arg Thr Phe Ser Glu Arg Thr Leu Ala Phe Val	325	330	335		
Arg Phe Ser Leu	Val Ser Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala	340	345	350		
Thr Ala Leu Glu	Leu Met Val Leu Asn Val Pro Arg Leu Met Thr Gln	355	360	365		
Asp Cys Leu Gln	Gln Ser Arg Lys Val Gly Asp Ser Pro Asn Ile Thr	370	375	380		
Glu Tyr Met Phe	Cys Ala Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys	385	390	395	400	

Lys Gly Asp Ser Gly Gly Pro His Ala Thr His Tyr Arg Gly Thr Trp
405 410 415

Tyr Leu Thr Gly Ile Val Ser Trp Gly Gln Gly Cys Ala Thr Val Gly
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His Phe Gly Val Tyr Thr Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln
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Lys Leu Met Arg Ser Glu Pro Arg Pro Gly Val Leu Leu Arg Ala Pro
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Phe Pro
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<213> Homo sapiens

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          20          25          30

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Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
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Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
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Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
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Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
          85          90          95

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Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
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Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
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Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
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Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
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Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
 180 185 190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
 195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
 210 215 220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
 225 230 235 240

Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly
 245 250 255

Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr
 260 265 270

Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln
 275 280 285

Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg
 290 295 300

Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser
 305 310 315 320

Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met
 325 330 335

Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser
 340 345 350

Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala
 355 360 365

Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly
 370 375 380

Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val
 385 390 395 400

Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr
405 410 415

Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu
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His Gly Val Leu His Arg Gln Arg Arg Ala Asn Ser Leu Leu Glu Glu
 35 40 45

Leu Trp Ser Ser Ser Leu Glu Arg Glu Cys Asn Glu Glu Arg Cys Ser
 50 55 60

Phe Glu Glu Ala Arg Glu Ile Phe Lys Ser Pro Glu Arg Thr Lys Gln
 65 70 75 80

Phe Trp Thr Ile Tyr Ser Asp Gly Asp Gln Cys Ala Ser Asn Pro Cys
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Gln Asn Gly Gly Thr Cys Gln Asp His Leu Lys Ser Tyr Val Cys Phe
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Cys Pro Leu Asp Phe Glu Gly Arg Asn Cys Glu Lys Asn Lys Asn Glu
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Gln Leu Ile Cys Ala Asn Glu Asn Gly Asp Cys Asp Gln Tyr Cys Arg
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Asp His Val Gly Thr Lys Arg Thr Cys Ser Cys His Glu Asp Tyr Val
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Leu Gln Pro Asp Glu Val Ser Cys Lys Pro Lys Val Glu Tyr Pro Cys
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Gly Arg Ile Pro Val Val Glu Lys Arg Asn Phe Ser Arg Pro Gln Gly
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Arg Ile Val Gly Gly Tyr Val Cys Pro Lys Gly Glu Cys Pro Trp Gln
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Ala Val Leu Lys Phe Asn Glu Ala Leu Leu Cys Gly Ala Val Leu Leu
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Asp Thr Arg Trp Ile Val Thr Ala Ala His Cys Phe Asp Lys Phe Gly
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Lys Leu Val Asn Ile Thr Val Val Leu Gly Glu His Asp Phe Ser Glu
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Lys Glu Gly Thr Glu Gln Val Arg Leu Val Glu Gln Val Ile Met Pro
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Asn Lys Tyr Thr Arg Gly Arg Thr Asp His Asp Ile Ala Leu Val Arg
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Phe Cys Ala Gly Tyr Met Asp Gly Thr Lys Asp Ala Cys Lys Gly Asp
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Ser Gly Gly Pro His Ala Thr His Tyr His Gly Thr Trp Tyr Leu Thr
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 <212> DNA
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 acaggttata ttgcattttt agcaggtatt taatgatttt gctctgatta atcaggagat 1620

gtgcagctca ttatctccat attattaatg ctcaactgta gtaaactc g

1671

<210> 10
 <211> 433
 <212> PRT
 <213> Danio rerio

<400> 10

Met Ser Leu Leu Leu Val Phe Ser Leu Leu Trp Ser Leu His Tyr Cys
 1 5 10 15

His Ser Ala Ala Val Phe Val His Arg Asp Glu Ala His Glu Val Leu
 20 25 30

Ile Arg Ser Lys Arg Ala Asn Ser Gly Trp Phe Glu Glu Leu Lys Thr
 35 40 45

Gly Asn Leu Glu Arg Glu Cys Leu Glu Glu Lys Cys Ser Tyr Glu Glu
 50 55 60

Ala Arg Glu Val Phe Glu His Thr Glu Ala Thr Asn Glu Phe Trp Lys
 65 70 75 80

Ile Tyr Asp Val Lys Asp His Cys Ala Ser Ser Pro Cys Glu His Asp
 85 90 95

Gly Leu Cys Thr Thr Gln Asn Ala Asp Ser Tyr Met Cys Leu Cys Ala
 100 105 110

Pro Gly Phe Ser Gly Arg His Cys Glu Gln Ser Ile Gly Asp Val Leu
 115 120 125

Asp Ser Cys Leu His Asp Asn Gly Gly Cys Glu His Phe Cys Thr Glu
 130 135 140

Gln Asp Gly Arg Arg Asn Cys Ser Cys Ala Asp Gly Tyr Tyr Leu Asp
 145 150 155 160

Asn Ser Gly Gln Lys Cys Arg Ser His Glu Val Phe Pro Cys Gly Lys
 165 170 175

Val Pro Leu Leu Gln Ala Gly Lys Ala Ala Asp His Gln Val Asp Leu
 180 185 190

Arg Ser Arg Ile Val Gly Gly Ser Glu Cys Pro Lys Gly His Cys Pro

195	200	205
Trp Gln Val Leu Leu Lys Tyr Gly Glu Lys Gly Phe Cys Gly Gly Val 210 215 220		
Ile Tyr Lys Pro Thr Trp Ile Leu Thr Ala Ala His Cys Leu Glu Lys 225 230 235 240		
Leu Lys Val Lys Phe Leu Arg Ile Val Ala Gly Glu His Asp Leu Glu 245 250 255		
Val Asp Glu Gly Thr Glu Gln Leu Ile Gln Val Asp Gln Met Phe Thr 260 265 270		
His Pro Ala Tyr Val Ser Glu Thr Ala Asp Ser Asp Ile Ala Leu Leu 275 280 285		
Arg Leu Arg Thr Pro Ile Val Tyr Ser Val Tyr Ala Val Pro Val Cys 290 295 300		
Leu Pro Leu Arg Glu Met Ala Glu Arg Glu Leu Trp Ala Val Ser Lys 305 310 315 320		
His Thr Val Ser Gly Trp Gly Lys Arg Ser Glu Asp Gly Pro Thr Ser 325 330 335		
Arg Leu Leu Arg Arg Leu Leu Val Pro Arg Ile Arg Thr Gln Glu Cys 340 345 350		
Val Gln Val Ser Asn Leu Thr Leu Thr Ser Asn Met Phe Cys Ala Gly 355 360 365		
Tyr Ile Glu Gly Arg Gln Asp Ser Cys Lys Gly Asp Ser Gly Gly Pro 370 375 380		
Leu Val Thr Arg Tyr Arg Asp Thr Ala Phe Leu Leu Gly Ile Val Ser 385 390 395 400		
Trp Gly Lys Gly Cys Ala Arg Pro Gly Ser Tyr Gly Ile Tyr Thr Arg 405 410 415		
Val Ser Asn Tyr Leu Gln Trp Ile Arg Gln Thr Thr Asn Thr Thr Ile 420 425 430		

His

<210> 11
 <211> 1341
 <212> DNA
 <213> Mus musculus

<400> 11
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 ctagggactg cagttttcat aaccaggag gaagcacatg gtgtcctaca caggcaaagg 120
 cgtgccaaact cactcctgga ggagctttgg cccggctctc tggagagaga gtgcaatgag 180
 gaacagtgtc cctttgagga ggcccgggag atcttcaaga gccctgagag gaccaagcag 240
 ttctggattg ttacagtga tggggaccag tgtgcctcga atccatgtca gaacgtaggt 300
 acctgccagg atcatctcaa gtcttacgtc tgcttctgcc tcttagactt tgagggtcgg 360
 aactgtgaga aaagcaagaa tgagcagctg atctgtgcaa atgaaaatgg tgactgtgac 420
 cagtactgca gggaccatgt agggaccaag cgtacctgta gctgtcatga ggactacacg 480
 ctacagccag atgaggtgtc ctgcaaacca aaagttgagt acccgtgtgg gagaatacct 540
 gttgtagaaa aaagaaactc cagcagccgc caaggccgca ttgtgggagg caacgtgtgc 600
 cccaaagggg agtgtccatg gcaggctgtg ctgaaaatca atgggttatt gctgtgtggg 660
 gccgtcctgc tggacgccag atggatagt accgcagccc actgcttcga taatatccgc 720
 tactggggaa acatcacagt ggtgatgggt gaacatgact tcagtgagaa ggatggggat 780
 gagcaagtac gacgggtgac acaggtcatc atgcccagaca agtacatccg cggcaagatc 840
 aaccacgaca ttgccctgct ccgccttcac cggcctgtga ccttcaactga ctacgtggtg 900
 cccctgtgtc tgcctgaaaa gtccttctcc gagaacaccc tagccagaat ccgcttctca 960
 agggtcagtg gctggggcca gctactggac cgtggtgcca cagccctgga actcatgtcc 1020
 atcgaggtgc cccggctgat gaccaggag tgtctggagc acgccaagca cagctctaac 1080
 acccccaaaa tcacagagaa catgttctgc gctggctaca tggatgggtac caaggacgcc 1140
 tgcaaggggtg acagcgggtg cccacatgcc acgcactacc atggcacatg gtatctgaca 1200
 ggtgtggtca gctgggggga gggctgtgca gctattgggtc acattgggggt gtacaccagg 1260
 gtctcccagt acatagactg gctggtcaga cacatggact ccaagctcca gggtgggggt 1320
 ttccgactcc cactactgta g 1341

<210> 12
 <211> 446
 <212> PRT
 <213> Mus musculus

<400> 12

Met Val Pro Gln Ala His Gly Leu Leu Leu Leu Cys Phe Leu Leu Gln
 1 5 10 15
 Leu Gln Gly Pro Leu Gly Thr Ala Val Phe Ile Thr Gln Glu Glu Ala
 20 25 30
 His Gly Val Leu His Arg Gln Arg Arg Ala Asn Ser Leu Leu Glu Glu
 35 40 45
 Leu Trp Pro Gly Ser Leu Glu Arg Glu Cys Asn Glu Glu Gln Cys Ser
 50 55 60
 Phe Glu Glu Ala Arg Glu Ile Phe Lys Ser Pro Glu Arg Thr Lys Gln
 65 70 75 80
 Phe Trp Ile Val Tyr Ser Asp Gly Asp Gln Cys Ala Ser Asn Pro Cys
 85 90 95
 Gln Asn Val Gly Thr Cys Gln Asp His Leu Lys Ser Tyr Val Cys Phe
 100 105 110
 Cys Leu Leu Asp Phe Glu Gly Arg Asn Cys Glu Lys Ser Lys Asn Glu
 115 120 125
 Gln Leu Ile Cys Ala Asn Glu Asn Gly Asp Cys Asp Gln Tyr Cys Arg
 130 135 140
 Asp His Val Gly Thr Lys Arg Thr Cys Ser Cys His Glu Asp Tyr Thr
 145 150 155 160
 Leu Gln Pro Asp Glu Val Ser Cys Lys Pro Lys Val Glu Tyr Pro Cys
 165 170 175
 Gly Arg Ile Pro Val Val Glu Lys Arg Asn Ser Ser Ser Arg Gln Gly
 180 185 190
 Arg Ile Val Gly Gly Asn Val Cys Pro Lys Gly Glu Cys Pro Trp Gln
 195 200 205
 Ala Val Leu Lys Ile Asn Gly Leu Leu Leu Cys Gly Ala Val Leu Leu
 210 215 220
 Asp Ala Arg Trp Ile Val Thr Ala Ala His Cys Phe Asp Asn Ile Arg
 225 230 235 240

Tyr Trp Gly Asn Ile Thr Val Val Met Gly Glu His Asp Phe Ser Glu
245 250 255

Lys Asp Gly Asp Glu Gln Val Arg Arg Val Thr Gln Val Ile Met Pro
260 265 270

Asp Lys Tyr Ile Arg Gly Lys Ile Asn His Asp Ile Ala Leu Leu Arg
275 280 285

Leu His Arg Pro Val Thr Phe Thr Asp Tyr Val Val Pro Leu Cys Leu
290 295 300

Pro Glu Lys Ser Phe Ser Glu Asn Thr Leu Ala Arg Ile Arg Phe Ser
305 310 315 320

Arg Val Ser Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu
325 330 335

Glu Leu Met Ser Ile Glu Val Pro Arg Leu Met Thr Gln Asp Cys Leu
340 345 350

Glu His Ala Lys His Ser Ser Asn Thr Pro Lys Ile Thr Glu Asn Met
355 360 365

Phe Cys Ala Gly Tyr Met Asp Gly Thr Lys Asp Ala Cys Lys Gly Asp
370 375 380

Ser Gly Gly Pro His Ala Thr His Tyr His Gly Thr Trp Tyr Leu Thr
385 390 395 400

Gly Val Val Ser Trp Gly Glu Gly Cys Ala Ala Ile Gly His Ile Gly
405 410 415

Val Tyr Thr Arg Val Ser Gln Tyr Ile Asp Trp Leu Val Arg His Met
420 425 430

Asp Ser Lys Leu Gln Val Gly Val Phe Arg Leu Pro Leu Leu
435 440 445

<210> 13
<211> 1260
<212> DNA
<213> Gallus gallus

<400> 13
atggtttcca ggcagtgcggt ggctttgctg ctctgcttcc cgctgctgggt tcctccttct 60

ctggaagcag tctttttaaa gcaggaagag gcaaacagca tttttcaaag gcacagaaga 120
gccaatagct tctttgaaga gataaagctg gggccactag agcgagaatg catagaagaa 180
aagtgttcat ttgaggaagc aagagagatc taccgtgatg atgagaggac aaaagagttc 240
tgccacatct attctgaccc caaccagtgt gactccagcc cctgtcagaa cggaggggagc 300
tgcgatgacc agtttcagga ttatgtctgc cgctgtcctc cggagtacga gggcaaaagc 360
tgtgaaacag ctgtggccga gaacctgaag tgcatttacg acaacggcgg ctgtgagcag 420
tactgtgctg acgagcagtc tgaaaaacga gtgtgcttct gtgcagaggg ctacgcttta 480
gcgagtgatg gagtgtcctg cattcccaa gtgaaatacc cttgtggaac gataccagtg 540
ctggcaagaa agaatacaac tgctcagggg agaatagtag gtggtgtcac ctgtcctccg 600
ggtgaatgtc catggcaagc ccttataata caggatcaga aagggaaatg tgggggtagt 660
ctgctctcac cagagtgggt ggtgactgca gctcattgcc tggactacgc tcattccaaa 720
cagctccggg tgaggctggg tgaatactca gtaaaagttg ctgagaaaac tgagcaagaa 780
agtggagtta gcaagatcat caggcacgaa gaatacacca ttggacaagt caatcatgac 840
attgccctcc tgaagctgga aacacccgtg aatctcaccg atttcgttgt gccaatatgt 900
ttgcctgaaa aacggtttgc agtgtacgag ctgtcctcca ttaagttctc aatggtgagc 960
ggatggggac ggctactaga tggaggggct acttctactt ttctgatgcg agttcatttg 1020
ccccgtgtaa agacacaaga atgtgaaaag caggctaatt tgaacatcac cgagaatatg 1080
ttctgtgcag gagacctgac cggtaaaaaa gactcctgca agggagacag tgggtggacct 1140
cacgtacaa agtacaagaa cacctggttt ctgactggga ttgtcagctg gggaaagggt 1200
tgtgtgtgtg aaggcagcta cggggtgtac acaagggtat ccagatacat caactgggtg 1260

<210> 14
<211> 425
<212> PRT
<213> Gallus gallus

<400> 14

Met Val Ser Arg Gln Cys Val Ala Leu Leu Leu Cys Phe Pro Leu Leu
1 5 10 15

Val Pro Pro Ser Leu Glu Ala Val Phe Leu Lys Gln Glu Glu Ala Asn
20 25 30

Ser Ile Phe Gln Arg His Arg Arg Ala Asn Ser Phe Phe Glu Glu Ile
35 40 45

Lys Leu Gly Pro Leu Glu Arg Glu Cys Ile Glu Glu Lys Cys Ser Phe

50		55		60	
Glu Glu Ala Arg Glu Ile Tyr Arg Asp Asp Glu Arg Thr Lys Glu Phe					
65		70		75	80
Trp His Ile Tyr Ser Asp Pro Asn Gln Cys Asp Ser Ser Pro Cys Gln					
		85		90	95
Asn Gly Gly Ser Cys Asp Asp Gln Phe Gln Asp Tyr Val Cys Arg Cys					
		100		105	110
Pro Pro Glu Tyr Glu Gly Lys Ser Cys Glu Thr Ala Val Ala Glu Asn					
		115		120	125
Leu Lys Cys Ile Tyr Asp Asn Gly Gly Cys Glu Gln Tyr Cys Ala Asp					
		130		135	140
Glu Gln Ser Glu Lys Arg Val Cys Phe Cys Ala Glu Gly Tyr Ala Leu					
145		150		155	160
Ala Ser Asp Gly Val Ser Cys Ile Pro Gln Val Lys Tyr Pro Cys Gly					
		165		170	175
Thr Ile Pro Val Leu Ala Arg Lys Asn Thr Thr Ala Gln Gly Arg Ile					
		180		185	190
Val Gly Gly Val Thr Cys Pro Pro Gly Glu Cys Pro Trp Gln Ala Leu					
		195		200	205
Ile Ile Gln Asp Gln Lys Gly Lys Cys Gly Gly Ser Leu Leu Ser Pro					
		210		215	220
Glu Trp Val Val Thr Ala Ala His Cys Leu Asp Tyr Ala His Ser Lys					
225		230		235	240
Gln Leu Arg Val Arg Leu Gly Glu Tyr Ser Val Lys Val Ala Glu Lys					
		245		250	255
Thr Glu Gln Glu Ser Gly Val Ser Lys Ile Ile Arg His Glu Glu Tyr					
		260		265	270
Thr Ile Gly Gln Val Asn His Asp Ile Ala Leu Leu Lys Leu Glu Thr					
		275		280	285
Pro Val Asn Leu Thr Asp Phe Val Val Pro Ile Cys Leu Pro Glu Lys					
		290		295	300

Arg Phe Ala Val Tyr Glu Leu Ser Ser Ile Lys Phe Ser Met Val Ser
305 310 315 320

Gly Trp Gly Arg Leu Leu Asp Gly Gly Ala Thr Ser Thr Phe Leu Met
325 330 335

Arg Val His Leu Pro Arg Val Lys Thr Gln Glu Cys Glu Lys Gln Ala
340 345 350

Asn Leu Asn Ile Thr Glu Asn Met Phe Cys Ala Gly Asp Leu Thr Gly
355 360 365

Lys Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly Pro His Ala Thr Lys
370 375 380

Tyr Lys Asn Thr Trp Phe Leu Thr Gly Ile Val Ser Trp Gly Lys Gly
385 390 395 400

Cys Ala Val Glu Gly Ser Tyr Gly Val Tyr Thr Arg Val Ser Arg Tyr
405 410 415

Ile Asn Trp Leu Lys Arg His Met Glu
420 425

<210> 15
<211> 443
<212> PRT
<213> Oryctolagus cuniculus

<400> 15

Met Ala Pro Gln Ala Arg Gly Leu Gly Leu Cys Ser Leu Leu Ala Leu
1 5 10 15

Gln Ala Ser Leu Ala Ala Val Phe Ile Thr Gln Glu Glu Ala His Ser
20 25 30

Val Leu Arg Arg Gln Arg Arg Ala Asn Ser Phe Leu Glu Glu Leu Arg
35 40 45

Pro Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Leu Cys Ser Phe Glu
50 55 60

Glu Ala Arg Glu Val Phe Gln Ser Thr Glu Arg Thr Lys Gln Phe Trp
65 70 75 80

Ile Thr Tyr Asn Asp Gly Asp Gln Cys Ala Ser Asn Pro Cys Gln Asn
 85 90 95
 Gly Gly Ser Cys Glu Asp Gln Ile Gln Ser Tyr Ile Cys Phe Cys Leu
 100 105 110
 Ala Asp Phe Glu Gly Arg Asn Cys Glu Lys Asn Lys Asn Asp Gln Leu
 115 120 125
 Ile Cys Met Tyr Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His
 130 135 140
 Val Gly Ser Gln Arg Ser Cys Arg Cys His Glu Gly Tyr Thr Leu Leu
 145 150 155 160
 Pro Asn Gly Val Ser Cys Thr Pro Thr Val Asp Tyr Pro Cys Gly Lys
 165 170 175
 Val Pro Ala Leu Glu Lys Arg Gly Ala Ser Asn Pro Gln Gly Arg Ile
 180 185 190
 Val Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Ala Ala
 195 200 205
 Leu Met Asn Gly Ser Thr Leu Leu Cys Gly Gly Ser Leu Leu Asp Thr
 210 215 220
 His Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Leu Ser Ser Leu
 225 230 235 240
 Arg Asn Leu Thr Ile Val Leu Gly Glu His Asp Leu Ser Glu His Glu
 245 250 255
 Gly Asp Glu Gln Val Arg His Val Ala Gln Leu Ile Met Pro Asp Lys
 260 265 270
 Tyr Val Pro Gly Lys Thr Asp His Asp Ile Ala Leu Leu Arg Leu Leu
 275 280 285
 Gln Pro Ala Ala Leu Thr Asn Asn Val Val Pro Leu Cys Leu Pro Glu
 290 295 300
 Arg Asn Phe Ser Glu Ser Thr Leu Ala Thr Ile Arg Phe Ser Arg Val
 305 310 315 320
 Ser Gly Trp Gly Gln Leu Leu Tyr Arg Gly Ala Leu Ala Arg Glu Leu

325	330	335
Met Ala Ile Asp Val Pro Arg Leu Met Thr Gln Asp Cys Val Glu Gln		
340	345	350
Ser Glu His Asn Pro Gly Ser Pro Glu Val Thr Gly Asn Met Phe Cys		
355	360	365
Ala Gly Tyr Leu Asp Gly Ser Lys Asp Ala Cys Lys Gly Asp Ser Gly		
370	375	380
Gly Pro His Ala Thr Ser Tyr His Gly Thr Tyr Leu Thr Gly Val Val		
385	390	395
Ser Trp Gly Glu Gly Cys Ala Arg Val Gly His Val Gly Val Tyr Thr		
405	410	415
Arg Val Ser Arg Asp Thr Glu Trp Leu Ser Arg Leu Met Arg Ser Lys		
420	425	430
Leu His His Gly Ile Gln Arg His Pro Phe Pro		
435	440	
<210> 16		
<211> 681		
<212> PRT		
<213> Mus musculus		
<400> 16		
Met Val Pro Gln Ala His Gly Leu Leu Leu Leu Cys Phe Leu Leu Gln		
1	5	10
Leu Gln Gly Pro Leu Gly Thr Ala Val Phe Ile Thr Gln Glu Glu Ala		
20	25	30
His Gly Val Leu His Arg Gln Arg Arg Ala Asn Ser Leu Leu Glu Glu		
35	40	45
Leu Trp Pro Gly Ser Leu Glu Arg Glu Cys Asn Glu Glu Gln Cys Ser		
50	55	60
Phe Glu Glu Ala Arg Glu Ile Phe Lys Ser Pro Glu Arg Thr Lys Gln		
65	70	75
Phe Trp Ile Val Tyr Ser Asp Gly Asp Gln Cys Ala Ser Asn Pro Cys		
85	90	95

Gln Asn Val Gly Thr Cys Gln Asp His Leu Lys Ser Tyr Val Cys Phe
 100 105 110

Cys Leu Leu Asp Phe Glu Gly Arg Asn Cys Glu Lys Ser Lys Asn Glu
 115 120 125

Gln Leu Ile Cys Ala Asn Glu Asn Gly Asp Cys Asp Gln Tyr Cys Arg
 130 135 140

Asp His Val Gly Thr Lys Arg Thr Cys Ser Cys His Glu Asp Tyr Thr
 145 150 155 160

Leu Gln Pro Asp Glu Val Ser Cys Lys Pro Lys Val Glu Tyr Pro Cys
 165 170 175

Gly Arg Ile Pro Val Val Glu Lys Arg Asn Ser Ser Ser Arg Gln Gly
 180 185 190

Arg Ile Val Gly Gly Asn Val Cys Pro Lys Gly Glu Cys Pro Trp Gln
 195 200 205

Ala Val Leu Lys Ile Asn Gly Leu Leu Leu Cys Gly Ala Val Leu Leu
 210 215 220

Asp Ala Arg Trp Ile Val Thr Ala Ala His Cys Phe Asp Asn Ile Arg
 225 230 235 240

Tyr Trp Gly Asn Ile Thr Val Val Met Gly Glu His Asp Phe Ser Glu
 245 250 255

Lys Asp Gly Asp Glu Gln Val Arg Arg Val Thr Gln Val Ile Met Pro
 260 265 270

Asp Lys Tyr Ile Arg Gly Lys Ile Asn His Asp Ile Ala Leu Leu Arg
 275 280 285

Leu His Arg Pro Val Thr Phe Thr Asp Tyr Val Val Pro Leu Cys Leu
 290 295 300

Pro Glu Lys Ser Phe Ser Glu Asn Thr Leu Ala Arg Ile Arg Phe Ser
 305 310 315 320

Arg Val Ser Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu
 325 330 335

Glu Leu Met Ser Ile Glu Val Pro Arg Leu Met Thr Gln Asp Cys Leu
 340 345 350

Glu His Ala Lys His Ser Ser Asn Thr Pro Lys Ile Thr Glu Asn Met
 355 360 365

Phe Cys Ala Gly Tyr Met Asp Gly Thr Lys Asp Ala Cys Ala Gly Asp
 370 375 380

Ser Gly Gly Pro His Ala Thr His Tyr His Gly Thr Trp Tyr Leu Thr
 385 390 395 400

Gly Val Val Ser Trp Gly Glu Gly Cys Ala Ala Ile Gly His Ile Gly
 405 410 415

Val Tyr Thr Arg Val Ser Gln Tyr Ile Asp Trp Leu Val Arg His Met
 420 425 430

Asp Ser Lys Leu Gln Val Gly Val Phe Arg Leu Pro Leu Leu Gly Ser
 435 440 445

Ala Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro
 450 455 460

Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys
 465 470 475 480

Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val
 485 490 495

Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr
 500 505 510

Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu
 515 520 525

Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His
 530 535 540

Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys
 545 550 555 560

Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln
 565 570 575

Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu
580 585 590

Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro
595 600 605

Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn
610 615 620

Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu
625 630 635 640

Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val
645 650 655

Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln
660 665 670

Lys Ser Leu Ser Leu Ser Pro Gly Lys
675 680

<210> 17
<211> 407
<212> PRT
<213> Bos taurus

<400> 17

Ala Asn Gly Phe Leu Glu Glu Leu Leu Pro Gly Ser Leu Glu Arg Glu
1 5 10 15

Cys Arg Glu Glu Leu Cys Ser Phe Glu Glu Ala His Glu Ile Phe Arg
20 25 30

Asn Glu Glu Arg Thr Arg Gln Phe Trp Val Ser Tyr Asn Asp Gly Asp
35 40 45

Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly Gly Ser Cys Glu Asp Gln
50 55 60

Leu Arg Ser Tyr Ile Cys Phe Cys Pro Asp Gly Phe Glu Gly Arg Asn
65 70 75 80

Cys Glu Thr Asp Lys Gln Ser Gln Leu Ile Cys Ala Asn Asp Asn Gly
85 90 95

Gly Cys Glu Gln Tyr Cys Gly Ala Asp Pro Gly Ala Gly Arg Phe Cys
100 105 110

Trp Cys His Glu Gly Tyr Ala Leu Gln Ala Asp Gly Val Ser Cys Ala
 115 120 125

Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile Pro Val Leu Glu Lys Arg
 130 135 140

Asn Gly Ser Lys Pro Gln Gly Arg Ile Val Gly Gly His Val Cys Pro
 145 150 155 160

Lys Gly Glu Cys Pro Trp Gln Ala Met Leu Lys Leu Asn Gly Ala Leu
 165 170 175

Leu Cys Gly Gly Thr Leu Val Gly Pro Ala Trp Val Val Ser Ala Ala
 180 185 190

His Cys Phe Glu Arg Leu Arg Ser Arg Gly Asn Leu Thr Ala Val Leu
 195 200 205

Gly Glu His Asp Leu Ser Arg Val Glu Gly Pro Glu Gln Glu Arg Arg
 210 215 220

Val Ala Gln Ile Ile Val Pro Lys Gln Tyr Val Pro Gly Gln Thr Asp
 225 230 235 240

His Asp Val Ala Leu Leu Gln Leu Ala Gln Pro Val Ala Leu Gly Asp
 245 250 255

His Val Ala Pro Leu Cys Leu Pro Asp Pro Asp Phe Ala Asp Gln Thr
 260 265 270

Leu Ala Phe Val Arg Phe Ser Ala Val Ser Gly Trp Gly Gln Leu Leu
 275 280 285

Glu Arg Gly Val Thr Ala Arg Lys Leu Met Val Val Leu Val Pro Arg
 290 295 300

Leu Leu Thr Gln Asp Cys Leu Gln Gln Ser Arg Gln Arg Pro Gly Gly
 305 310 315 320

Pro Val Val Thr Asp Asn Met Phe Cys Ala Gly Tyr Ser Asp Gly Ser
 325 330 335

Lys Asp Ala Cys Lys Gly Asp Ser Gly Gly Pro His Ala Thr Arg Phe
 340 345 350

Arg Gly Thr Trp Phe Leu Thr Gly Val Val Ser Trp Gly Glu Gly Cys
355 360 365

Ala Ala Ala Gly His Phe Gly Ile Tyr Thr Arg Val Ser Arg Tyr Thr
370 375 380

Ala Trp Leu Arg Gln Leu Met Gly His Pro Pro Ser Arg Gln Gly Phe
385 390 395 400

Phe Gln Val Pro Leu Leu Pro
405